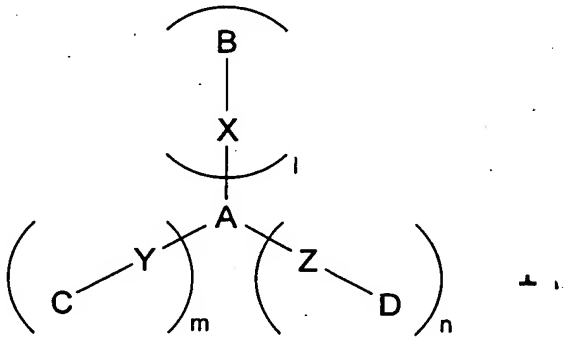
CLAIMS

1. A photoresist base material comprising an extreme ultra-violet reactive organic compound represented by the following general formula (1),



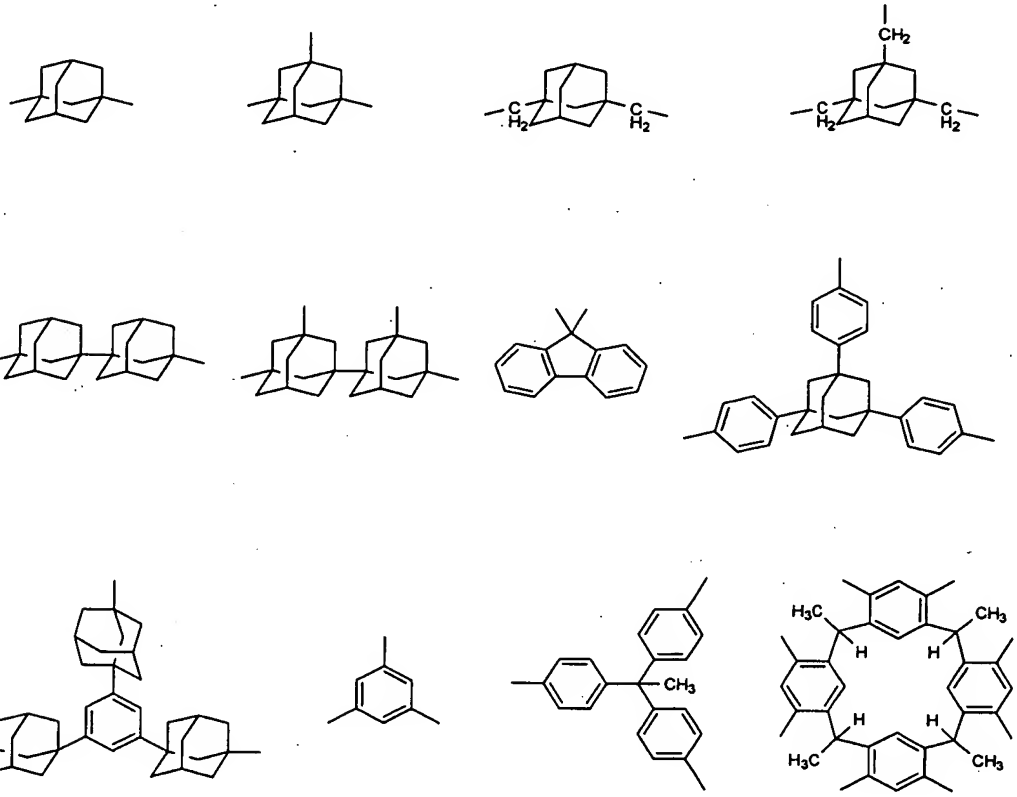
(1)

wherein A is a central structure that is an aliphatic group having 1 to 50 carbon atoms, an aromatic group having 6 to 50 carbon atoms, an organic group containing said aliphatic group and said aromatic group together or an organic group having a cyclic structure formed by repetition of these groups, each of B, C and D is independently an extreme ultra-violet reactive group, a group having reactivity to the action of chromophore active to extreme ultra-violet, or a C_1 to C_{50} aliphatic group, C_6 to C_{50} aromatic group, an organic group containing said aliphatic group and said aromatic group together or a substituent having a branched structure, containing such a reactive group, each of X, Y and Z is independently a single bond or an ether bond, each of l, m and n is independently an integer of 0 to 5 satisfying $l + m + n \geq 1$,

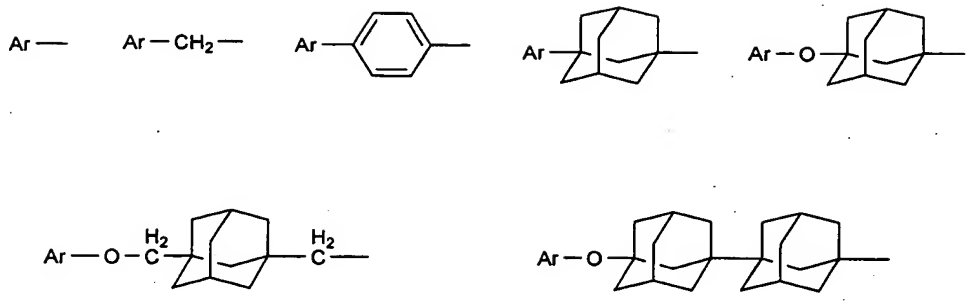
and A, B, C and D may contain a substituent having a heteroatom.

2. The photoresist base material as recited in claim 1, wherein said organic compound reactive to extreme ultra-violet is in an amorphous state at room temperature and has a molecule whose average diameter is 2 nm or less.

3. The photoresist base material as recited in claim 1 or 2, wherein A is an organic group represented by



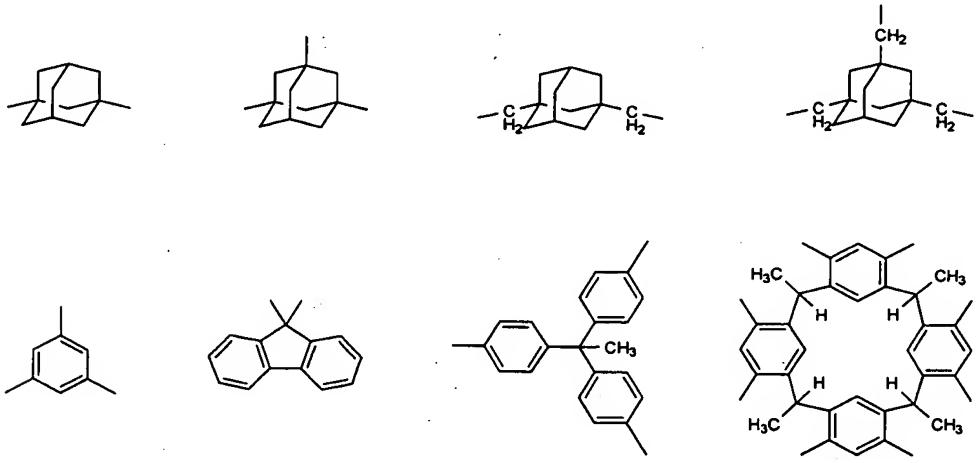
each of B, C and D is an extreme ultra-violet reactive group, a group having reactivity to the action of chromophore active to extreme ultra-violet, or an organic group represented by



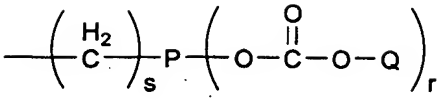
wherein Ar is a phenyl or naphthyl group substituted with RO- and/or ROCO- in which R, RO- and ROCO are extreme ultra-violet reactive groups or groups having reactivity to the action of a chromophore active to extreme ultra-violet, and

X, Y and Z are ether bonds.

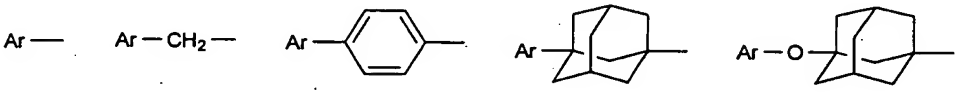
4. The photoresist base material as recited in claim 3, wherein A is an organic group represented by



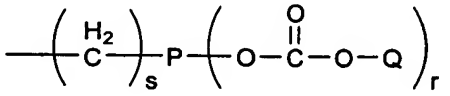
each of B, C and D is a hydrogen atom, tert-butyl, tert-butyloxycarbonylmethyl, tert-butyloxycarbonyl, 1-tetrahydropyranyl, 1-tetrahydrofuranyl, 1-ethoxyethyl, 1-phenoxyethyl, an organic group represented by



in which P is an aromatic group having a valence of (r + 1) and having 6 to 20 carbon atoms, Q is an organic group having 4 to 30 carbon atoms, r is an integer of 1 to 10 and s is an integer of 0 to 10,
or an organic group represented by



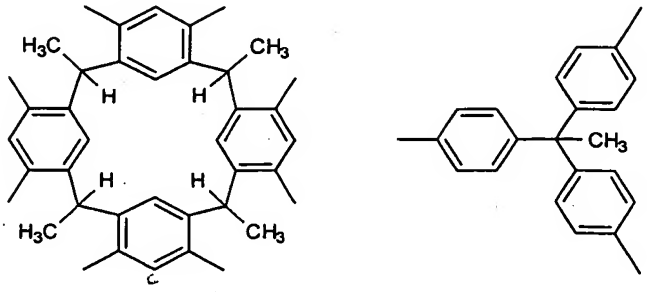
in which Ar is a phenyl or naphthyl group substituted with RO- and/or ROCO- in which R is hydrogen, tert-butyl, tert-butyloxycarbonylmethyl, tert-butyloxycarbonyl, 1-tetrahydropyranyl, 1-tetrahydrofuranyl, 1-ethoxyethyl, 1-phenoxyethyl, an organic group represented by



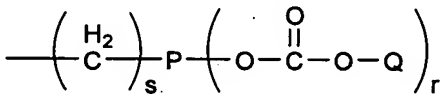
in which P is an aromatic group having a valence of (r + 1) and having 6 to 20 carbon atoms, Q is an organic group having 4 to 30 carbon atoms, r is an integer of 1 to 10 and s is an integer of 0 to 10,
and X, Y and Z are ether bonds.

5. The photoresist base material as recited in claim 4,

wherein A is an organic group represented by



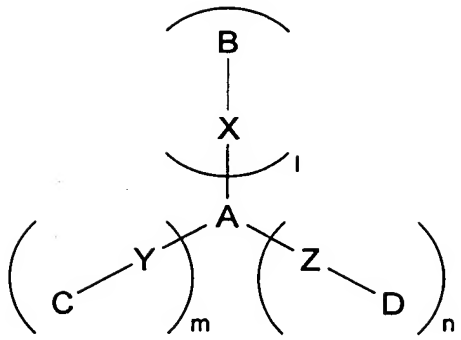
each of B, C and D is a hydrogen atom, tert-butyl, tert-butyloxycarbonylmethyl, tert-butyloxycarbonyl, 1-tetrahydropyranyl, 1-tetrahydrofuranyl, 1-ethoxyethyl, 1-phenoxyethyl or an organic group represented by



in which P is an aromatic group having a valence of (r + 1) and having 6 to 20 carbon atoms, Q is an organic group having 4 to 30 carbon atoms, r is an integer of 1 to 10 and s is an integer of 0 to 10,

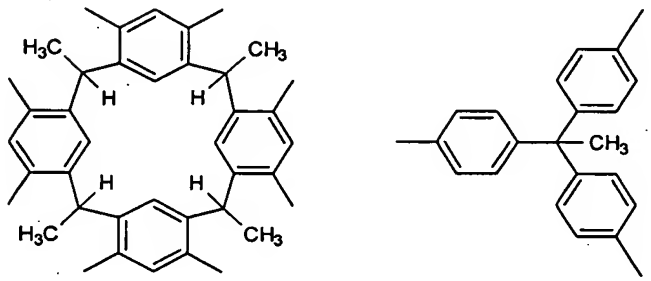
and X, Y and Z are ether bonds.

6. A photoresist base material comprising a radiation-sensitive organic compound represented by the following general formula (1),

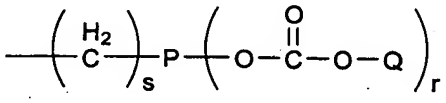


(1)

wherein A is an organic group represented by



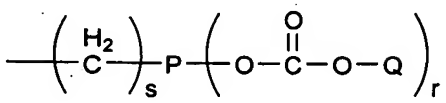
each of B, C and D is independently an organic group represented by



in which P is an aromatic group having a valence of (r + 1) and having 6 to 20 carbon atoms, Q is an organic group having 4 to 30 carbon atoms, r is an integer of 1 to 10 and s is an integer of 0 to 10, and

l + m + n = 3 or 8.

7. The photoresist base material as recited in claim 6, wherein the organic group represented by



is 4-(tert-butoxycarbonyloxy)benzyl or 3,5-di(tert-butoxycarbonyloxy)benzyl.

8. The photoresist base material as recited in claim 6, wherein the radiation is extreme ultra-violet or electron beam.

9. The photoresist base material as recited in any one of claims 1 to 8, wherein at least one of B, C and D is a hydrogen atom and X, Y and Z are ether bonds.

10. The photoresist base material as recited in any one of 1 to 8, which has a basic impurity content of 10 ppm or less.

11. A photoresist composition containing a solid content containing the photoresist base material recited in any one of claims 1 to 8 and a solvent.

12. A photoresist composition comprising a solid content containing the photoresist base material recited in claim 10 and a solvent.

13. The photoresist composition as recited in claim 11 or 12, which further contains an optically-acid-generating agent.

14. A method for purification of a photoresist base material, which comprises washing the photoresist base material recited in any one of claims 1 to 8 with an acidic aqueous solution and treating the material with an ion-exchange resin.

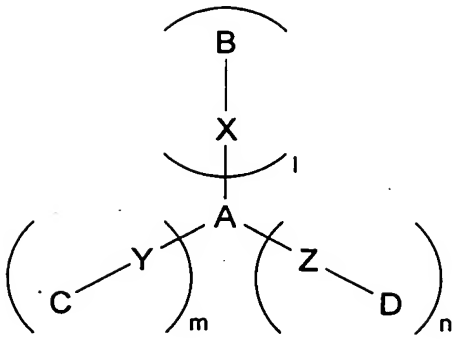
15. The method for purification of a photoresist base material as recited in claim 14, wherein said acidic aqueous solution is an acetic acid aqueous solution.

16. A method for improvement of the photoresist base material recited in any one of claims 1 to 8 in radiation sensitivity, which comprises decreasing the content of basic impurities to 10 ppm or less.

17. A method for fine processing by lithography, which uses the photoresist composition recited in claim 11 or 12.

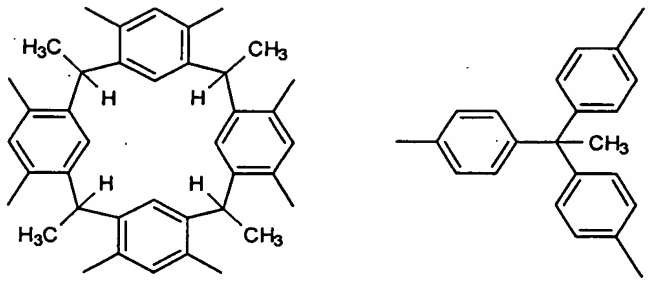
18. A semiconductor device fabricated using the photoresist composition recited in claim 11 or 12.

19. An organic compound represented by the following general formula (1),

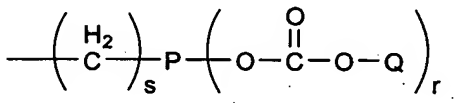


(1)

wherein A is an organic group represented by



each of B, C and D is independently an organic group represented by



in which P is an aromatic group having a valence of (r + 1) and having 6 to 20 carbon atoms, Q is an organic group having 4 to 30 carbon atoms, r is an integer of 1 to 10 and s is an integer of 0 to 10,

and

$l + m + n = 3$ or 8.

20. The organic compound as recited in claim 19, which has a basic impurity content of 10 ppm or less.

21. A method for purification of an organic compound, which comprises washing the organic compound recited in claim 19 with an acidic aqueous solution and treating the compound with an ion-exchange resin.